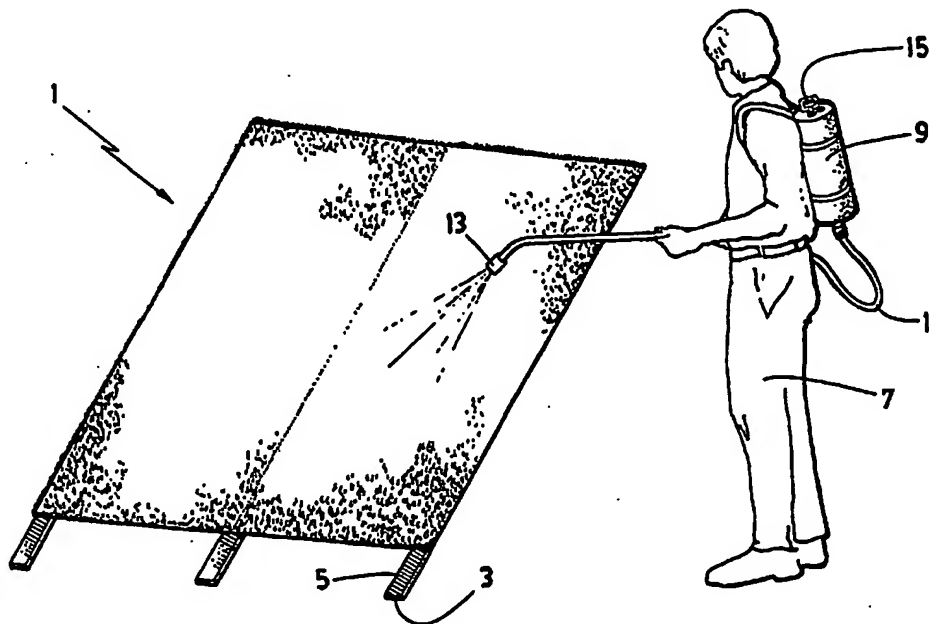




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : A47G 27/04		A1	(11) International Publication Number: WO 95/32654
			(43) International Publication Date: 7 December 1995 (07.12.95)
(21) International Application Number: PCT/CA95/00292		(74) Agents: GRAY, Brian, W. et al.; Blake, Cassels & Graydon, Box 25, Commerce Court West, Toronto, Ontario M5L 1A9 (CA).	
(22) International Filing Date: 16 May 1995 (16.05.95)			
(30) Priority Data: 08/251,955 1 June 1994 (01.06.94) US		(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ, UG).	
(60) Parent Application or Grant (63) Related by Continuation US 08/251,955 (CIP) Filed on 1 June 1994 (01.06.94)			
(71) Applicant (for all designated States except CA US): TAC- FAST SYSTEMS S.A. [CH/CH]; 15, route du Bugnon, Case postale 106, CH-1752 Villars-sur-Glâne 2 (CH).		Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
(71) Applicant (for CA only): TAC-FAST SYSTEMS CANADA LIMITED [CA/CA]; Suite 710, 15 Wertheim Court, Rich- mond Hill, Ontario L4B 3H7 (CA).			
(72) Inventor; and (75) Inventor/Applicant (for US only): PACIONE, Joseph, Rocco [CA/CA]; 127 Elgin Street, Thornhill, Ontario L3T 1W7 (CA).			

(54) Title: METHOD OF INSTALLING LOOPED BACKED CARPET



(57) Abstract

A method of installing a looped backed carpet is disclosed in which water is applied to the carpet (1), the carpet (1) is allowed to expand, and the carpet (1) is then affixed in place by a hook and loop system (5) in its expanded state.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

METHOD OF INSTALLING LOOPED BACKED CARPET

FIELD OF THE INVENTION

This invention relates to a method of installing a looped backed carpet by a hook and loop installation structure.

5 BACKGROUND OF THE INVENTION

Traditionally, wall to wall carpets have been installed by either being glued to concrete flooring (in commercial installations) or by stretching between staggered rows of steel pins (such as in the Roberts "smooth-edge" form of installation).

10 In United States Patent 4,822,658 dated April 18, 1989, a new system of carpet installation is disclosed in which a carpet is constructed having a backing substantially consisting of loops to be installed by hooked tape attached to the floor by pressure sensitive adhesive.

15 However even with this system, certain carpet products such as one's manufactured using synthetic nylon fibre can have significant atmospheric dimensional stability problems.

These problems stem from the fact that nylon absorbs moisture at a rate of approximately 6% of its weight and expands at a rate of approximately 30% of its size.

20 It seems certain manufactured products present more of a problem than others. Many reasons are contributing factors, for example, the type of manufacturing process used and the type of material (latex, C.V.A. Polyurethane etc.) used to encapsulate and tuft lock the bundles of fibre that are tufted through the primary backing. A real problem is that a
25 carpet installer on site is unaware of any impending atmospheric problem until it is too late. Once the carpet has been installed at the perimeter and seams the ability for it to grow at the perimeter is eliminated and any growth will manifest itself in the form of unsightly buckles and wrinkles etc. The growth that occurs is often caused from the atmospheric swings in humidity

which can occur. Such swings are most common in buildings which are not climate and temperature controlled.

Attempts to control this buckling have focused on

- (a) gluing the carpet down along its whole undersurface;
- 5 (b) offsetting the expansion of nylon fibre by increasing the weight and rigidity of the carpet by the addition of fibreglass as a stabilizing factor; or
- (c) using a hook and loop system to attach the carpet across its whole undersurface.

10 Increased use of fibreglass can give the carpet greater initial dimensional stability but does not entirely solve the problem. In fact in some situations such increased fibreglass can make the buckling worse if the carpet is not rigid enough to withstand the expansion forces. More significantly, increased rigidity makes it much more difficult to manoeuvre,
15 roll, stretch and cut the carpet. It can be very difficult to pattern match such carpets since there is little or no "give" in the carpet by which to adjust the carpet to match the patterns.

It has also been tried, with varying degrees of success, to smooth irregularities on hand sewn seams of woolen carpeting that
20 developed on seaming by treating the jute backing of the seamed area with small amounts of hot water. Sprinkling hot water onto the jute backing at the seam may shrink the carpet and thereby reduce localized unevenness.

SUMMARY OF THE INVENTION

It has now been found, surprisingly, and contrary to currently
25 advocated installation techniques, that carpet can be advantageously installed by a method which first acclimatizes the carpet for possible expansion due to moisture by adding water to the carpet and then fixing the carpet to the floor in its expanded state.

The amount of moisture that is required to expand, for
30 instance, nylon and the time required to wait for the carpet to achieve

maximum expansion are such that it is quite feasible to apply water to the carpet during installation without significantly delaying the installation.

Further a hook and loop system allows the carpet to be retained in place in its expanded condition after the carpet has dried and would otherwise tend to revert to its contracted state. This allows the carpet to retain its shape, even after drying. Further it has now been found that the carpet does not further expand or buckle even with subsequent cycles of humidity and dryness.

Thus the invention, in one aspect, consists of a method of installing a looped backed carpet comprising the following steps:

- (a) installing tape having upwardly facing hooks, onto a floor, the hooks removably covered to prevent premature attachment of the hooks to a carpet.
- (b) loose laying a carpet having a loop backing over top of the tape.
- (c) applying water to the carpet to allow the carpet fibres to absorb water.
- (d) waiting for a period to allow the carpet to achieve substantially maximum expansion.
- (e) removing the tape covering to attach the carpet to the floor in its substantially expanded state.

In another more general aspect, the invention consists simply of wetting the carpet to allow it to expand, waiting for it to expand and then installing it onto the floor with a hook and loop system.

In a more specific aspect of the invention, the method consists of installing a looped backed carpet comprising the following steps:

- (a) installing tape having upwardly facing hooks onto a floor, the hooks removably covered to prevent premature attachment of the hooks to a carpet.
- (b) loose laying carpet having a loop backing over top of the tape.
- (c) removing at least some of the tape covering to attach the carpet to the floor.
- (d) applying water to the carpet to allow the carpet to absorb water.

- (e) waiting for a period to allow the carpet to achieve substantially maximum expansion.
- (f) disengaging the carpet from the tape in at least some areas to relieve pressure and buckling created by the carpet expansion.
- 5 (g) re-attaching the carpet to the tape in a substantially expanded state.

BRIEF DESCRIPTION OF THE DRAWING

Figure 1 is a view of a carpet installer spraying a carpet.

Figure 2 is a section view showing two overlapped carpet strips after wetting prior to the release of buckling expansion.

10 Figure 3 is a section view showing two overlapped carpet strips after release of buckling expansion and just prior to final cutting.

PREFERRED EMBODIMENT

In figure 1 is shown a carpet 1 loosely installed on a floor
15 overlaying carpet tape 3. The tape initially has a tape covering 5 which prevents attachment of the loops on the back of carpet 1 to the hooks on tape 3 (as shown best in figure 2) until the tape covering has been removed. In figure 1 carpet installer 7 has a simple pressurized water container 9 having a hose 11 and spray nozzle 13. Such water canisters
20 are typically pressurized by a hand pump 15 on the top of the can and can easily hold one gallon of water. Installer 7 simply passes spraying head 13 across the carpet in a number of passes sufficient to deposit about one gallon of water per one hundred square yards.

In figure 1 since carpet 1 is not attached to tape 3, the carpet
25 will simply grow after it has been wet, assuming it is made of an artificial or synthetic material which grows when wet. Nylon is the most common such material, and it will absorb water so as to gain 6% by weight and 30% by size. It has been found that this absorption takes place, in a typical carpet,

where the water is applied by spraying on the top surface over a period of approximately four hours.

The water could equally be applied to the back of the carpet (assuming that the carpet does not have a waterproof backing) or
5 immediately to the floor as the carpet is unrolled. Moisture however applied will be readily absorbed by the nylon fibres.

An experiment was done using a nylon carpet from Peerless Carpet, Montreal, Canada. This nylon carpet was sent to Textile Rubber for backing with a thermoset elastomer polyurethane, and it was then laminated
10 with a knit loop backing.

The carpet was attached to a concrete floor at its perimeter by the use of a hooked tape, and was then sprayed with water from a water container from the top as shown in figure 1 until water was visible on the pile when the pile was depressed with a finger.

15 Within one hour there was visible buckling of the carpet. Constrained around its perimeter, the carpet buckled along only one direction. The buckles continued to rise for four hours. Within four hours the carpet achieved maximum expansion or buckling. The buckling stayed in the carpet for approximately two hours and then started to go back down.

20 Subsequent tests have proven that in most nylon carpets available today, substantially maximum expansion is achieved in four hours. Further, if the carpet is attached equally along its perimeter edges or not attached at all, the expansion usually only occurs in one direction along the machine gage of the carpet. This appears to be the path of least
25 resistance. Thus in carpet strips, the expansion usually occurs along the narrow width of the strip and not along the length.

In subsequent experiments, the carpet was attached to the floor as described in the first experiment above. After the carpet achieved maximum buckling in four hours, the carpet was removed from the tape to
30 relieve the pressure caused by the buckling and then re-attached to the tape. After the carpet dried, it did not pull off of the tape and remained in its acclimatized state, even after repeated wetting and drying cycles.

Further experiments with this acclimatized carpet in a humidity and temperature controlled tent has shown that such carpet does not buckle or move when exposed to cycles of temperature and humidity, even when exposed to 90% humidity for three days.

5 It will be appreciated that under normal circumstances, carpets are generally in air conditioned, climate controlled environments and that it would be rare for the humidity level in a room to be over 90% for more than three days. This may happen however in the case of an air conditioning breakdown.

10 The carpet grows primarily in only one direction (typically the width of a roll) along the machine gage. It is thus possible to install the carpet over tapes in anticipation of this growth. If the carpet is attached to the floor first, a visible buckling can be seen after the application of water as an indication that the carpet has grown. Thus as shown in figure 2,
15 tapes 18 and 19 are attached to the floor, initially with a covering (not shown). Carpet strips 21, 23 and 25 (or any number of additional carpet strips) are laid over the tapes and tape covering so that the seams meet over the tape.

As it is normally only necessary to re-do every other seam in
20 order to release tension arising from growth in, for instance, carpet piece 23, the seam 27 can be finished between carpet piece 21 and 25. The installer will normally leave a slight overlap at every other seam, for instance, between carpet piece 23 and carpet piece 21. This assures that there is room for the carpet to overlap to create an even seam, even if the
25 carpet does not grow significantly after wetting.

In the normal case, the carpet pieces would be attached at least to the tapes under the longitudinal seams. However carpet piece 21, for instance, would only be partially attached to tape 19 as shown allowing for an overlap.

30 Figure 2 shows the arrangement after initial preliminary installation and after the addition of water to the surface of the carpet. Water sprayed on the carpet as shown in figure 1 will result normally in

buckling 29 along the width of the carpet as shown in figure 2. Although the carpet is, of course, narrower in width and in length, the carpet generally expands along the machine gage width along the path of least resistance. It is possible for some expansion to occur in length, but this has
5 not been observed in experiments to date. This, however, could easily be accommodated by the release and reattachment of the carpet at the ends as required.

After the buckles 29 have reached a certain size, in approximately four hours, an experienced installer will have a visual clue
10 that (a) he has sprayed that particular carpet strip and (b) the strip has reached its maximum level of expansion. The installer can then relieve the pressure of the buckling in, for instance, piece 21 and piece 23 by removing the carpet pieces from tape 19 and expanding them so as to eliminate buckles 29. Piece 21 and 23 will thus overlap further on tape 19 as shown
15 in figure 3 and the installer can then cut along the top of the tape at 31 as shown in figure 3 to create an even seam. The excess pieces 33 and 35 as shown in figure 3 can be discarded and an even seam achieved.

This invention is useful for any natural or synthetic fibre used in carpets which grows or expands with the addition of water. Nylon is the
20 most common such synthetic fibre.

In addition, although the invention has been described with a loop back carpet and hooked tapes (the commercially advantageous form of a hook and loop system), it is equally applicable to a loop tape and hooked carpet.

CLAIMS

1. A method of installing a looped backed carpet comprising the following steps:
 - 5 (a) installing tape having upwardly facing hooks, onto a floor, the hooks removably covered to prevent premature attachment of the hooks to a carpet.
 - (b) loose laying a carpet having a loop backing over top of the tape.
 - (c) applying water to the carpet to allow the carpet fibres to absorb water.
 - 10 (d) waiting for a period to allow the carpet to achieve substantially maximum expansion.
 - (e) removing the tape covering to attach the carpet to the floor in its substantially expanded state.
2. A method as set out in claim 1 in which after step (d) the carpet is cut
15 and fit to a room or adjoining carpet pieces while in an expanded state.
3. A method as set out in claim 1 in which step (b) comprises loose laying multiple carpet strips overlapping each other and trimming such pieces together after step (d), while in an expanded state to achieve a smooth joint between such pieces.
- 20 4. The method of claim 1 in which the carpet has nylon pile.
5. The method of claim 4 in which the waiting period of step (d) is at least two hours.
6. The method of claim 4 in which the waiting period is at least four hours.
7. The method of claim 6 in which the waiting period is no more than six
25 hours.

8. The method of claim 1 or 7 in which the water is applied as a mist or spray to the top of the carpet.
9. The method of claim 8 in which the water is applied at a rate no less than one gallon per hundred square yards.
- 5 10. A method of installing a looped backed carpet comprising the following steps:
- (a) installing tape having upwardly facing hooks onto a floor, the hooks removably covered to prevent premature attachment of the hooks to a carpet.
 - 10 (b) loose laying carpet having a loop backing over top of the tape.
 - (c) removing at least some of the tape covering to attach the carpet to the floor.
 - (d) applying water to the carpet to allow the carpet to absorb water.
 - (e) waiting for a period to allow the carpet to achieve substantially
 - 15 maximum expansion.
 - (f) disengaging the carpet from the tape in at least some areas to relieve pressure and buckling created by the carpet expansion.
 - (g) re-attaching the carpet to the tape in its substantially expanded state.
- 20 11. The method of claim 10 in which the water is applied as a mist or spray to the top of the carpet.
12. The method of claim 11 in which the water is applied at a rate no less than one gallon per hundred square yards.
13. The method of claim 10 or 12 in which the waiting period is at least
- 25 three hours and no more than six hours.
14. The method of claim 12 in which the carpet is installed in strips and the

tape is installed on the floor generally to align underneath the longitudinal edges of the carpet strips.

15 15. The method of claim 14 in which at least some of the longitudinal edges of the carpet strips overlap each other and are attached to the floor during step (c) in an overlapped relationship.

16. The method of claim 15 in which only the overlapped pieces are disengaged during step (f) and are then re-installed in an overlapped relationship during step (g) and comprising the additional step (h) in which the join between overlapped pieces is made by cutting both pieces along the overlap to achieve a matched seam and discarding the unused edge pieces.

17. A method of installing a looped backed nylon carpet comprising the following steps:

- 15 (a) installing tape having upwardly facing hooks onto a floor, the hooks removably covered to prevent premature attachment of the hooks to a carpet.
- (b) loose laying carpet strips having a loop backing over top of the tape and in which at least some strips overlap an adjoining strip along a longitudinal edge of the strip.
- 20 (c) removing at least some of the tape covering to attach the carpet strips to the floor substantially along their longitudinal edges.
- (d) applying a spray of water to the carpet at a rate of at least one gallon per hundred square yards.
- (e) waiting for a period of at least four hours and not more than six hours to allow the carpet to achieve substantially maximum expansion.
- 25 (f) disengaging the carpet strips from the tape in at least some areas to relieve the pressure and buckling by the carpet expansion.
- (g) re-attaching the carpet strips in a substantially expanded state to

the tape, overlapping an adjoining strip.

- (h) cutting the longitudinal edges of both carpet strips along the overlap to achieve a smooth join and discarding the cut pieces.

18. A method of installing a carpet having a fibre which expands when wet
5 comprising the steps of:

- (a) wetting the carpet
- (b) waiting for it to expand
- (c) installing it onto a floor while still in its expanded stated using a hook and loop attachment system.

1/3

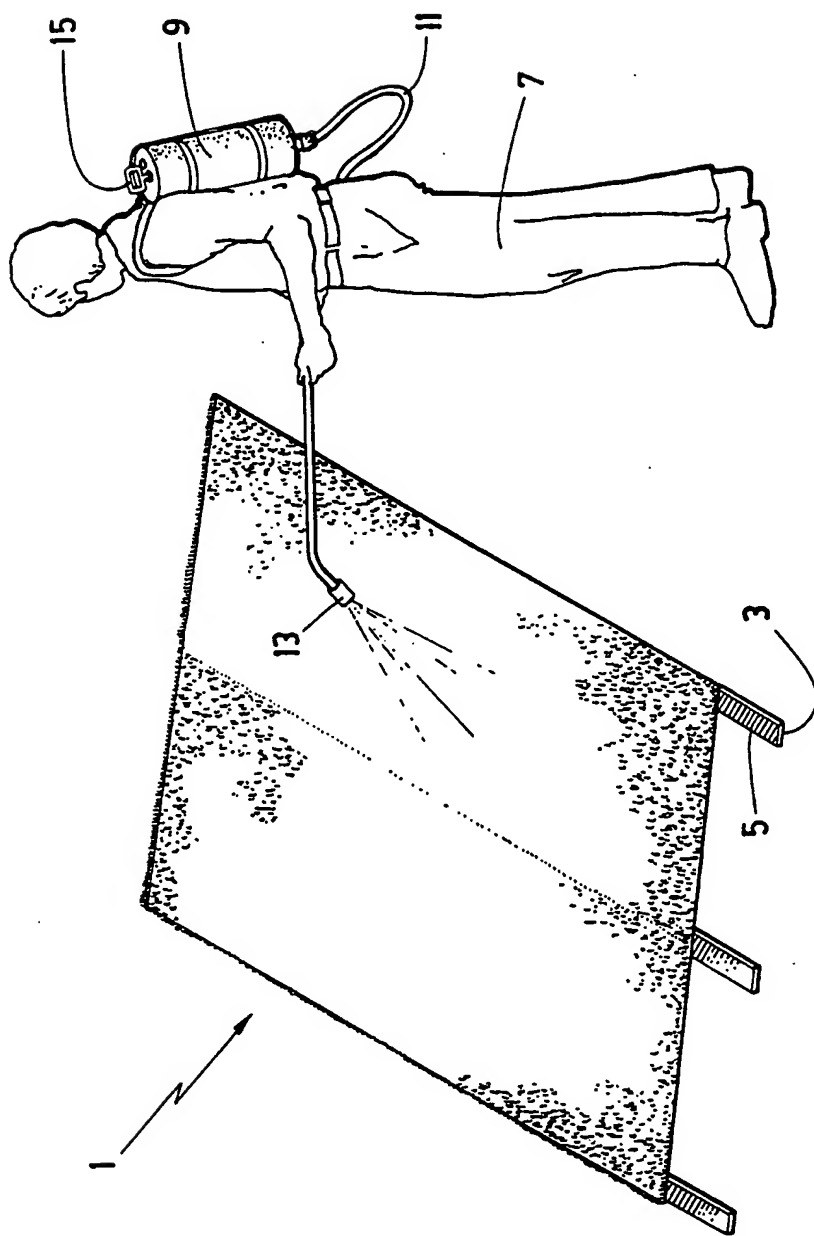


FIG. 1

2/3

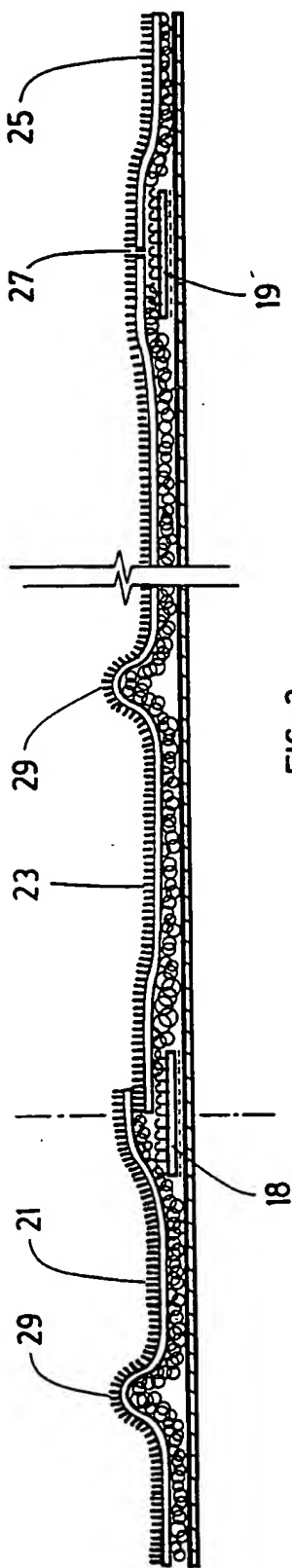


FIG. 2

3/3

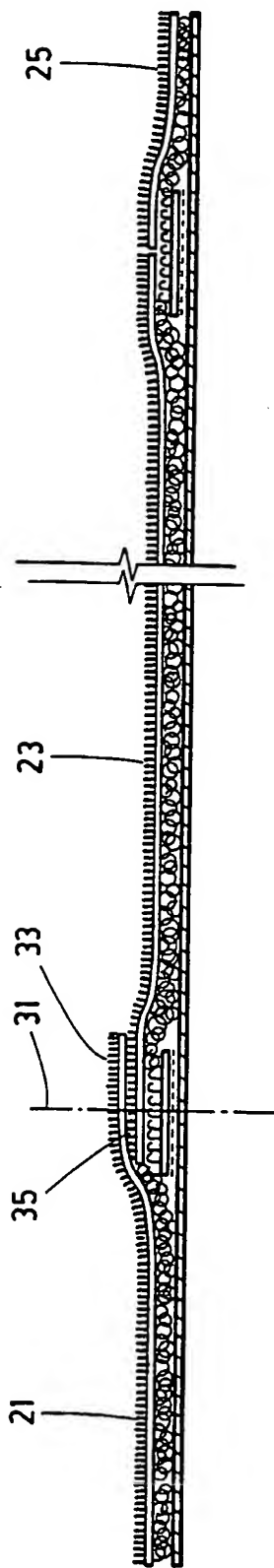


FIG. 3

INTERNATIONAL SEARCH REPORT

Intern: XXXXXXXXXX lication No
PCT/C XXXXXXXXXX /00292

A. CLASSIFICATION OF SUBJECT MATTER IPC 6 A47G27/04		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 6 A47G		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US,A,4 822 658 (PACIONE JOSEPH R) 18 April 1989 cited in the application see the whole document ---	1,10,17,18
A	BE,A,876 236 (POORTERE ETS SA) 3 September 1979 -----	
<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Further documents are listed in the continuation of box C. </div> <div> <input checked="" type="checkbox"/> Patent family members are listed in annex. </div> </div>		
<div style="display: flex;"> <div style="flex: 1;"> <p>* Special categories of cited documents :</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="flex: 1;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p> </div> </div>		
Date of the actual completion of the international search <div style="text-align: center; font-weight: bold;">22 August 1995</div>		Date of mailing of the international search report <div style="text-align: center; font-weight: bold;">04.10.95</div>
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer <div style="text-align: center; font-weight: bold;">Vistisen, L</div>

INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern. Application No

PCT/CA/00292

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-4822658	18-04-89	AU-A- 2693688	29-06-89
		CA-A- 1314379	16-03-93
		DE-D- 3888135	07-04-94
		DE-T- 3888135	22-09-94
		EP-A- 0321978	28-06-89
		JP-A- 1280419	10-11-89
		NO-B- 175320	20-06-94

BE-A-876236	03-09-79	NONE	

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☒ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.